

Tier 3: Central Tailings Orientation - 19

1. L&D_Orientation_PowerPointDesign_T3_Tailings

1.1 Central Tailings





1.2

<http://extportal.vale.com/ld/sud/modules/Linked%20Resource%20Documents/Canadian%20Operations%20Tailings%20Management%20Policy%202018.pdf>

Central Tailings Area Orientation

Tier Three – Site Specific Access

1.3 Canadian Operations Tailings Management Policy

<div><h2>Canadian Operations Tailings Management Policy</h2></div> <div></div>
<p>Vale believes that sustainable development is achieved when its business generates value for its shareholders while supporting the social empowerment, maintenance and improvement of the health and safety of its workers and host communities. This also involves the environmental responsibility and economic development of the regions where it operates, through conscious and responsible management, corporate voluntary actions and cross-sectoral partnerships.</p> <p>One of Vale's principles is to prioritize risk and impact management, seeking zero harm¹ for its employees and communities and establishing a positive social, economic and environmental legacy in the territories where it operates. Since mining is an activity related to mineral deposits with finite lifespans, sustainability legacies depend on the development of new economic venues throughout the mineral cycle, which enables social wellbeing in harmony with the environment.</p> <p>Vale and its subsidiaries are committed to implement management systems and practices of health, safety, quality and environment in all its operations, ensuring the strategic understanding of the issues related to these subjects, which may affect the ability to achieve results expected by the organization.</p> <p>Vale Canada is a member of the Mining Association of Canada (MAC) and subscribes to MAC's Towards Sustainable Mining (TSM) initiatives and the MAC tailings management framework. At Vale's Canadian Tailings Management Facilities, the prime objective is zero harm. This is achieved through responsible tailings management and a management system that is implemented through the actions of its employees, contractors and consultants.</p> <div></div> <div><p>Link to: Canadian Operations Tailings Management Policy</p></div>

1.4 Canadian Operations Tailings Management Policy



Canadian Operations Tailings Management Policy

These actions require the following commitments:

- planning, designing, constructing and operating the tailings facilities in a manner that reduces long-term impacts, risks and liability;
- compliance with regulatory requirements and conformance with reasonable and prudent engineering practice, design criteria, company standards/guidelines and our facility-specific tailings management systems;
- engaging with Communities of Interest, taking into account their considerations in relation to the design, operation and management of the tailings facility;
- managing tailings facilities commensurate with the risks they pose through implementation of Best Available Technology and Best Available Practice, with the objective of Zero Harm and meeting performance, corporate governance, environmental and social requirements;
- managing solids and water within designated areas; and
- establishing an ongoing program of review, including Independent Review and continual improvement of health, safety and environmental performance through the management of risks associated with each of Vale Canada's tailings facilities.



I have Read and Understand the
Canadian Operations Tailings Management Policy
Click to Proceed

1.5 Course Objectives

Course Objectives

Upon completion of this module as a worker you will be able to:

- Follow Plant Entry Procedure
- Identify Site Specific Hazards and Controls for the Central Tailings Area.
- Follow Procedures in the event of:
 - Equipment Damage
 - Personal Injury
 - Process Upset (Emergency Preparedness)
- Complete Plant Exit Procedure Checklist



1.6 Course Objectives

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1.7 Introduction

Introduction

Central Tailings Overview

1.8 Central Tailings Area Overview

Central Tailings Area Overview

The Booster Station receives the tailings and pyrrhotite products pumped from the Clarabelle Mill, and over-flow water from the concentrate thickeners.

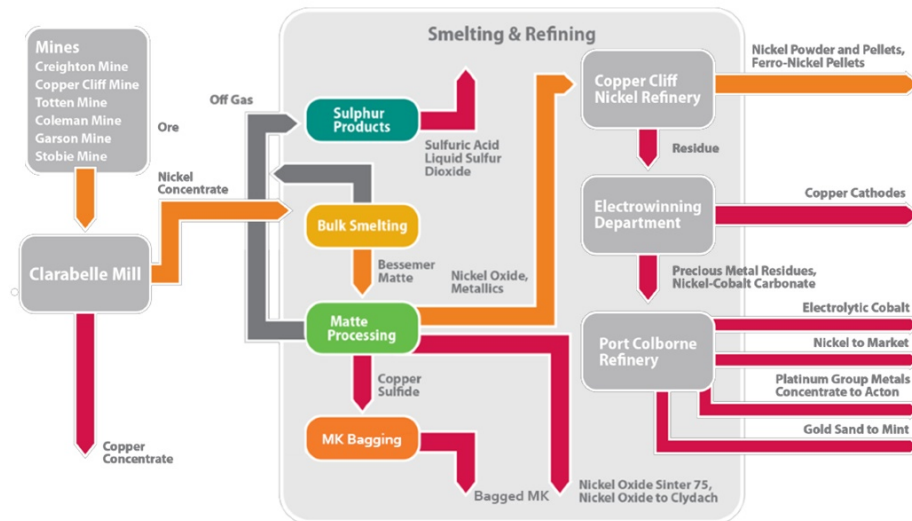
In addition the station receives sludge from the Copper Cliff Waste Water Treatment Plant (CCWWTP), process water from the Filtering Plant and mine water/slimes pumped from Froot-Stobie Sand Plant.

The Booster Station pumping systems are operated and controlled to provide adequate tailings supply to Hill Station while diverting the remainder and the contaminated products to the normal tailings disposal areas.



1.9 Central Tailings Area Overview

Central Tailings Area Overview

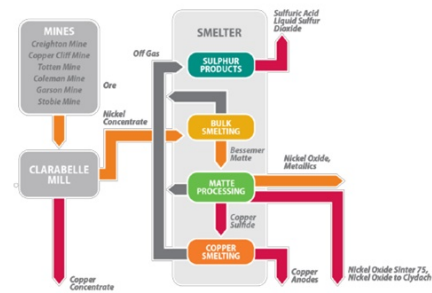


1.10 Central Tailings Area Overview

Central Tailings Area Overview

Tailings are received from Booster and Hill Stations and distributed to the appropriate containment areas. The area also receives mine water and sand plant slimes from Creighton Mine.

The water level in this area is regulated to maintain coverage of the tailings and to provide a supply of process water for use in milling and other operations.



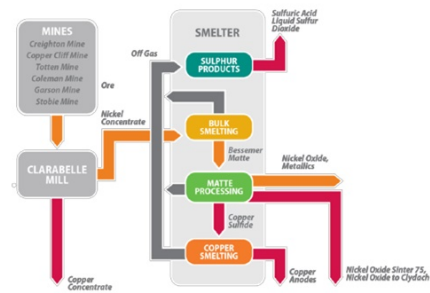
1.11 Central Tailings Area Overview

Central Tailings Area Overview

The siphon controls the rate of discharge of water from the tailings area to the Copper Cliff creek system. Seepage water from the perimeter dams is collected in ponds and returned to the storage area.



Grey lines are the pyrotite lines
Dotted lines are the rock tailings lines



1.12 Plant Entry

Plant Entry

Driving In, Walking In

1.13 Approaching The Plant

Approaching The Plant

There are several entrances to the Central Tailings Area:

- Power St Gate
- Club Road Gate
- Creighton Gate
- North Mine #9 Gate

All gates are secured through either Lenel access or Plant Protection. You must have associated approvals prior to entering the gates.



1.14 Parking

Parking

There are two designated areas for parking in the Central Tailings Area. All other traffic takes necessary precautions to park in a way that does not obstruct other traffic.

Power Street Parking Lot

When the gates are locked down, proceed to the right of the parking lot.



Hill Station Parking Lot

Parking is in front of the Hill Station Building. Heavy trucks are encouraged to park further away from the building to not impede smaller traffic.



1.15 Approaching Sign in Location

Approaching Sign in Location

All contractors and visitors entering into the Central Tailings Area need to be signed in at two locations:

When visiting the Tailings area, the sign in and sign out is at the Tailings Office at Hill Station.

All contractors and visitors to the Booster and Domes area must sign in and out at the Booster Control Room.

For contractors and visitors in the area outside of the normal working hours of 7:00am to 4:30pm, they need to comply with the Central Tailings Area After Daylight Hours Authorization Policy.



1.16 After Daylight Hours Authorization Policy

After Daylight Hours Authorization

The Central Tailings Area After Daylight Hours Authorization Policy requires contractors, visitors or workers to work through their Vale Contact Person to get appropriate authorization to be in areas after Daylight Hours. The process includes the completion of the After Hours Road Use Authorization Form including:

- Identifying the individual(s) to be working in the area outside of normal operating hours including their signatures on the bottom of the form
- Initial authorization from the Vale Contact Person
- Final authorization from the Operations Supervisor or their immediate designate

The policy requires individuals to promptly advise the Operations Supervisor of road conditions that could possibly present a hazard and afford proper escalation. It also requires individuals to have a map with their authorized route of travel clearly identified.



The image shows a sample of the 'Central Tailings Area After Daylight hours Authorization Form'. The form includes the Vale logo at the top right. Below the title, there are fields for 'Date' and 'Vale Plant Contact' (highlighted in yellow). A 'Company' field is also present. The 'Project/Work Description' section contains a disclaimer: 'This document is not valid without an attached map showing the approved road use, signed by both the user and Operations Supervisor.' At the bottom, there are signature lines for 'Signature of Vale Plant Contact' (highlighted in yellow) and 'Signature of driver' (with three yellow lines for a signature).



Plant Hazards and Controls

1.18 Site Specific Hazards

Site Specific Hazards

Using the tools that you learned in Tier 1 Orientation, ensure to use operation controls to mitigate risk associated to the identified hazards.



Be Aware

Be aware of my surroundings and the risks around me.



Follow Policies & Procedures

Our internal policies and procedures guide us in doing our work in a manner that reduces risk.

The following section lists identified hazards that may be encountered in the work you're doing. Knowing if these hazards apply to your work can be found through:

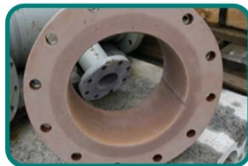
- Vale Contact Person
- PHA/PHR (or other Risk Assessment Tools)
- SLAM



1.19 Rubber Lined Pipes - Hazard

Rubber Lined Pipes - Hazard

Rubber is bonded to metal or plastic to provide a tough, corrosion resistant lined pipe. The Central Tailings area sometimes uses rubber lined pipes and vessels in it's process.



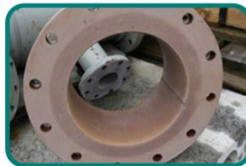
The health hazard common to rubber lined pipes is the potential for fire during hot work.



1.20 Rubber Lined Pipes - Control

Rubber Lined Pipes - Control

To mitigate the risk of fires with rubber lined pipes, The Central Tailings Area has implemented the following:



All pipes in the Central Tailings Area are presumed to be rubber lined and must be treated as such, until proven otherwise.

All rubber lined pipes and vessels in the vicinity of hot work should be capped with a non-flammable cover, mechanically fastened, to prevent it from being accidentally or inadvertently removed.

All hot work must be guarded by a dedicated fire watch guard with a fully charged and running water hose capable of directing water at the pipe or vessel; this is to prevent fire, not to fight fire.



1.21 Buried Lines - Hazard

Buried Lines - Hazard

The Tailings area has many buried high pressure lines.

Any damage to these could result in shutdown times at various locations.



1.22 Buried Lines - Control

Buried Lines - Control

To mitigate the possibility of damaging buried process lines, take the following precautions.

- Use caution
- Obtain and properly complete an Excavation permit
- Contact your Vale Contact Person regarding any excavation



1.23 Central Tailings Area Terrain - Hazard

Central Tailings Area Terrain - Hazard



The Central Tailings Area is vast and is very easy to get lost on one of the many secondary roads.

Off the road, there exist numerous hazards associated to varying terrain.

On many occasions, the root cause of such incidents is from workers underestimating the risks associated with the ground condition.

Tailings materials are not natural soils and may behave differently than regular ground leading to:

- Soft shoulders along roadways
- Water saturated soils lend to sinkable terrain.



1.24 Central Tailings Area Terrain - Control

Central Tailings Area Terrain - Control



To mitigate the risks associated with suspect terrain, take the following precautions:

Stick to the main roadways while driving Central Tailings Area and obey all traffic signs and speed limits.

All vehicles must carry a portable telephone or radio in case of any problems or emergencies that arise during travel.



1.25 Central Tailings Area Terrain – Control (2)

Central Tailings Area Terrain - Control



Follow the Central Tailings Area Protocol, including:

- Always have a map of your assigned route.
- Have appropriate authorization for the work you're performing.
- Have appropriate PHR/SSA's completed depending on your work.
- Any Contractor on Vale property must have a PHR prior to working on the property.



1.26 Central Tailings Area Terrain – Control (2)

Central Tailings Area Terrain - Control



Follow applicable speed limits:

- Central Tailings main haulage roads are limited to a 50 Km/hr speed limit.
- All secondary roads are subject to 25km/h.



1.27 Adverse Weather – Hazard

Adverse Weather – Hazard



From time to time, people who are working in the Central Tailings Area may be impacted by adverse weather, affecting their ability to travel and/or work.

Rain: introduces influxes of water, potentially affecting the integrity of roads or introducing slippery conditions.

Snow Storms: Severe Snow Storms have the potential of introducing white-out conditions which obscure shoulder boundaries introducing the risk of workers going off the road.

Lightning: Working with mobile equipment in open areas increases the possibility of lightning strikes.

Fog: same as snow.



1.28 Adverse Weather – Control

Adverse Weather – Control



To mitigate the risks associated with adverse weather, the Central Tailings Area has introduced an Adverse Weather Guideline which includes:

The official closure of roadways in the Central Tailings Area through the Central Tailings Patrolman to the Clarabelle Control Room.

The evacuation of workers in the area, where possible.

Where conditions restrict workers from exiting, instruction to park on the side of the road with four-way flashers until the all clear is given or when help arrives.



1.29 Mobile Equipment – Hazard

Mobile Equipment – Hazard



The Central Tailings Area has many pieces of large equipment performing various stages of work:

Haulage Trucks: Haul materials throughout the area. These include tandem or triaxle dump trucks and off road rock trucks.

Dust Suppression: prevents fugitive dusts from leaving Vale property. These include water trucks, media spreaders, among others.

Reclamation Equipment: works towards re-greening areas in accordance with legislative requirements. These typically include media spreaders and hydroseeders.



1.30 Mobile Equipment – Hazard

Mobile Equipment – Hazard



Water truck with trailer mounted Hydroseeder.

With this equipment, the operator is spraying water or a chemical dust suppressant.

The operator has limited visibility in this vehicle, particularly behind the unit.

In addition, the material being sprayed can cause a mist that makes visibility around the machinery a challenge.



1.31 Mobile Equipment – Hazard

Mobile Equipment – Hazard

Hydroseeder with a 24 foot spray bar attached.

Operator visibility is limited.
Note the additional operator on the top of the unit.

This vehicle needs a great deal of room to maneuver.



1.32 Mobile Equipment – Hazard

Mobile Equipment – Hazard



This is a snow groomer converted for use on the tailings facility.

The blade is 16ft wide.

This unit is capable of operating on steep slopes and so vigilance is required when working near this vehicle as it may travel in areas that are unexpected.



1.33 Mobile Equipment – Hazard

Mobile Equipment – Hazard



This is a haybuster attached to a tractor.

Hay is “sprayed” on the surface of the tailings to control dust. Bails of straw or hay are delivered to the Central Tailings daily from area farms.

Occasionally, debris from farm fields such as broken hay rakes, pieces of steel or rocks are unknowingly transported inside the hay bale.

These can easily become projectiles able to travel 50 feet or more in a few seconds. Accordingly, this machinery must be afforded a wide berth.

It is advisable to make eye contact with the operator when travelling near this machine so that he/she can cease operating the haybuster.



1.34 Mobile Equipment – Hazard

Mobile Equipment – Hazard

This is an agricultural sprayer with the capacity to spray chemical dust suppressant over a 90 foot span.

Visibility is limited, especially from the rear.

This vehicle obviously has a very large turning radius.

Sprayed material can cause misting that can affect visibility for others.



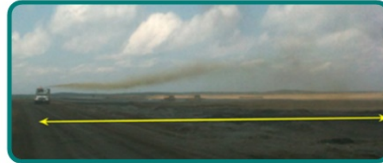
1.35 Mobile Equipment – Hazard

Mobile Equipment – Hazard

Hydroseeders spray chemical dust suppressant onto the surface of the tailings.

Suppressant can easily be sprayed a distance of over 700 ft.

Workers need to stay clear of the plume when working around this unit.



1.36 Mobile Equipment – Hazard

Mobile Equipment – Control



To mitigate risks associated with mobile equipment in the Central Tailings Area, there are some general controls to consider:

Stick to the main roadways while driving Central Tailings Area and obey all traffic signs and speed limits.

When travelling on smaller roadways and you encounter a large truck or piece of mobile equipment, pull over onto the shoulder and give the right of way to the other vehicle.

Use extreme caution, and make sure you give trucks enough room to pass.

Stay clear of all mobile equipment performing work in the Central Tailings Area.



1.37 Equipment Damage

Equipment Damage

1.38 Equipment Damage

Equipment Damage

An incident is an event that results in loss or harm to personnel (injury/illness), environment, asset, or equipment.

Even with "near misses", all workers, including Offsite Personnel are encouraged to initiate and/or participate.

Intent is to prevent recurrences and reduce or eliminate any further injuries.

Get in touch with your Vale Contact Person for any information required on the Incident/Accident Investigation system.

Incident Management (SAP IM)



Click to log into the SAP IM database to process Incident, Near Miss, and Unsafe Condition reports.



Web-based Search tool
Records are from prior day or earlier



SAP IM Procedures
Tools & Resources



1.39 Personal Injury

Personal Injury

1.40 Personal Injury

Personal Injury

Booster Station & Central Tailings Area Emergency Numbers

In the case of personal injury, generally, contact your Supervisor..... report immediately to First Aid. In the event you cannot physically report to First Aid, phone first aid:

Booster Station & Central Tailings Area Emergency Numbers

#1 First Aid	6622
Booster Station	6761
Hill Station	6762
Clarabelle Mill	
Control Room	6659



1.41 Emergency Preparedness

Emergency Preparedness

1.42 Emergency Preparedness

Emergency Preparedness

The Surface Tier 2 Orientation provided guidance on the application of Emergency Preparedness including activating an emergency and how to classify.

The following is how to respond to an emergency at the Central Tailings Area.



1.43 Notification – Central Tailings Area

Emergency Preparedness

Notification – Central Tailings Area

Before you begin work, find out:

- Where the nearest phone is
- Where the emergency numbers are posted
- What the nearest door number is
- All roads have signage
- All maps have routes



Booster Station & Central Tailings Area Emergency Numbers

#1 First Aid	6622
Booster Station	6761
Hill Station	6762
Clarabelle Mill	
Control Room	6659



1.44 Emergency Preparedness Procedures – Site Specific

Emergency Preparedness

The Internal Safe Assembly areas for the Booster and Tailings areas are:

- The Booster Station Maintenance lunchroom and
- The Hill Station Lunchroom



1.45 Emergency Preparedness Procedures – Site Specific

Emergency Preparedness

The External Safe Assembly areas for the Booster and Tailings areas are:

- Outside Booster Station door 238
- The Hill Station Outside Door #1

For contractors not in close proximity, stay in your vehicle, shut off the air conditioning, and drive away from the area.



Booster Station



Hill Station Parking Lot



1.46 Plant Exit

Plant Exit

1.47 Plant Exit

Plant Exit

Good work practices dictate that you close the loop on work you were doing to avoid creating risks or hazards for other work groups, cross shifts, or other work in the area. Here are some tasks to consider when getting ready to exit the plant to ensure the safety to you and those around you:

- ✓ **Housekeeping** – Is your worksite cleaned up after your job?
- ✓ **Personal Lock and Tag** – Has your personal protection been removed at the end of the shift.
- ✓ **Status Tagging** - Is there ongoing work that needs a status tag placed or is there equipment in Bad Order that needs to be identified?
- ✓ **End States** – Have you left the process in the proper state?
- ✓ **Waste Segregation** - Have you disposed of materials in the appropriate waste receptacles/bin/area?
- ✓ **Control room** – Do I need to let the control room know that I'm clear of an area?
- ✓ **Vale Contact Person** – do they need an end of shift report from me?
- ✓ **Permits** – do I need to close or hand in any permits?



1.48 Conclusion

Conclusion

1.49 Conclusion

Conclusion

This concludes the material for the Central Tailings Area Tier 3 Orientation. You should now have a working knowledge and understanding of:

- Plant Entry
- Site Specific Hazards and Controls for Central Tailings Area.
- Procedures in the event of:
 - Equipment Damage
 - Personal Injury
 - Process Upset (Emergency Preparedness)
- Plant Exit Procedure

This Orientation provided information to access the Central Tailings Area. In order to feel comfortable with the area, you may arrange a field visit with your Vale Contact Person to specifically identify procedures provided in the Orientation.

Additionally, depending on the site or work you're doing, you may require task-specific information through either the local Learning & Development Group or your Vale Contact Person.

1.50 Conclusion

Remember, At Vale we believe **Life Matters Most** and that *no job is worth doing if it cannot be done safely.*

Thank-you for your participation and your commitment to safety at Vale.



1.51 Start The Module Quiz



**Thank you for completing the
Vale Online Module Training.**

To start the module Quiz

CLICK HERE